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THE AMERICAN
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[All Rights Reserved.]

The Astoria Plant of the New York Consolidated Gas Company.

[Prepared for the JOURNAL, by MR. C. C. SIMPSON, JR.]

CHAPTER V.

With everything running smoothly in connection with the first unit, work was started, during the summer of 1910, on the second, which was to be employed in the manufacture of carbureted water gas. This unit, as can be seen from the key map (Fig. 2) lies immediately east of the coal gas unit, and, like the latter, is divided into two practically independent sections. Except for such portion of the unit as serves jointly for both sections, only the western half of this water gas plant has been built; but the half of a 40,000,000-foot plant is by no means a small undertaking, and as there were many more than interesting features in connection with its construction, you will probably agree that a detailed description of the various buildings and apparatus will be of interest.

Fig. 70 shows the work in progress on the generator house foundations. Practically all of the apparatus in this building, with the exception of the generating sets, is to be carried on the steel work, thus requiring considerable area for the column footings; and as the generators themselves are of such weight as to call for extensive foundations, it was found to be economical to place a 3-foot thick slab of solid concrete over the entire area of the building. The wide trough in the center of Fig. 70 is the excavation for a 2 track subway, running north and south, under the lower floor of the building. This subway is to contain 2 narrow gauge tracks, on which cars will be operated for coal and ash service. The coal for the generators will be dumped from cars into hoppers placed in the subway roof, and from these hoppers the narrow gauge subway cars will be loaded, then run onto hydraulic elevators, and raised to the charging floor, where they will again be run onto a system of tracks leading to the charging openings of the generators. The ashes from the generators will be dumped directly into ash hoppers in the subway roof and the cars, after loading from these hoppers, will be raised to the ground level by the elevators, and run outside of the building to the ash dump. All handling of ash cars from the generator house to the dump is to be done by suitable power mover.

A later view of the generator house site (Fig. 71) shows the walls and roof beams of the subway in place, and on either side the concrete slabs for the twelve 12-foot Williamson sets. In the background of this picture looms up, like a distant range of mountains, the coal stacked by the storage bridge. Two months later (when Fig. 72 was taken) the steel frame of the generator house had been completed, ready for the walls and roof. While nothing like either of the retort houses in point of size, this building is nevertheless a notable structure as far as generator houses are concerned, being 215 feet long, 85 feet wide, and 93 feet in height. The relatively great height is due to the type of the generator sets installed, the carbureter and superheater being combined in one shell, superimposed on the generator. The nominal generating capacity of the 12 sets in this building is to be 20,000,000 cubic feet per day. While work was in progress on the generator house, excavation for the tank foundation of an 11,000,000-foot relief holder has been started, this holder being intended to take care of the west generator house only. Fig. 73 shows the excavation ready for the concrete foundations of the tank, 142 feet in diameter, and also the placing of the concrete for the tank wall footings. Several months later Fig. 74 shows the steel tank bottom ready to be lowered into place, this operation being a rather interesting one to watch. The tank bottom must, of course, be fabricated in a raised position to allow the sheets to be riveted together. When the rivetting is completed one man is stationed at each of the numerous screw jacks, which are holding the bottom up from its foundation; and, at the signal from the foreman in charge, each jack is moved ¼ a turn, any local uneveness being corrected by individual jacks. Proceeding thus, in a very short space of time the great area of steel is finally landed on the concrete base, ready to be grouted in, and the jack-holes are closed with bolted plates.

In Fig. 75 are to be seen the steel and concrete in place for the west condenser foundations; the condensers, as can be noted in later illustrations, are not to be inclosed in a building, but left entirely in the open.

Fig. 76 affords a general view of the whole plant, as it appeared in January, 1911. On the left is seen the coal gas unit, now operating to its full capacity, and, in the foreground, the completed concrete tank for the second storage holder. Immediately in the rear of this tank is the water gas unit, meter house, which unfortunately partly

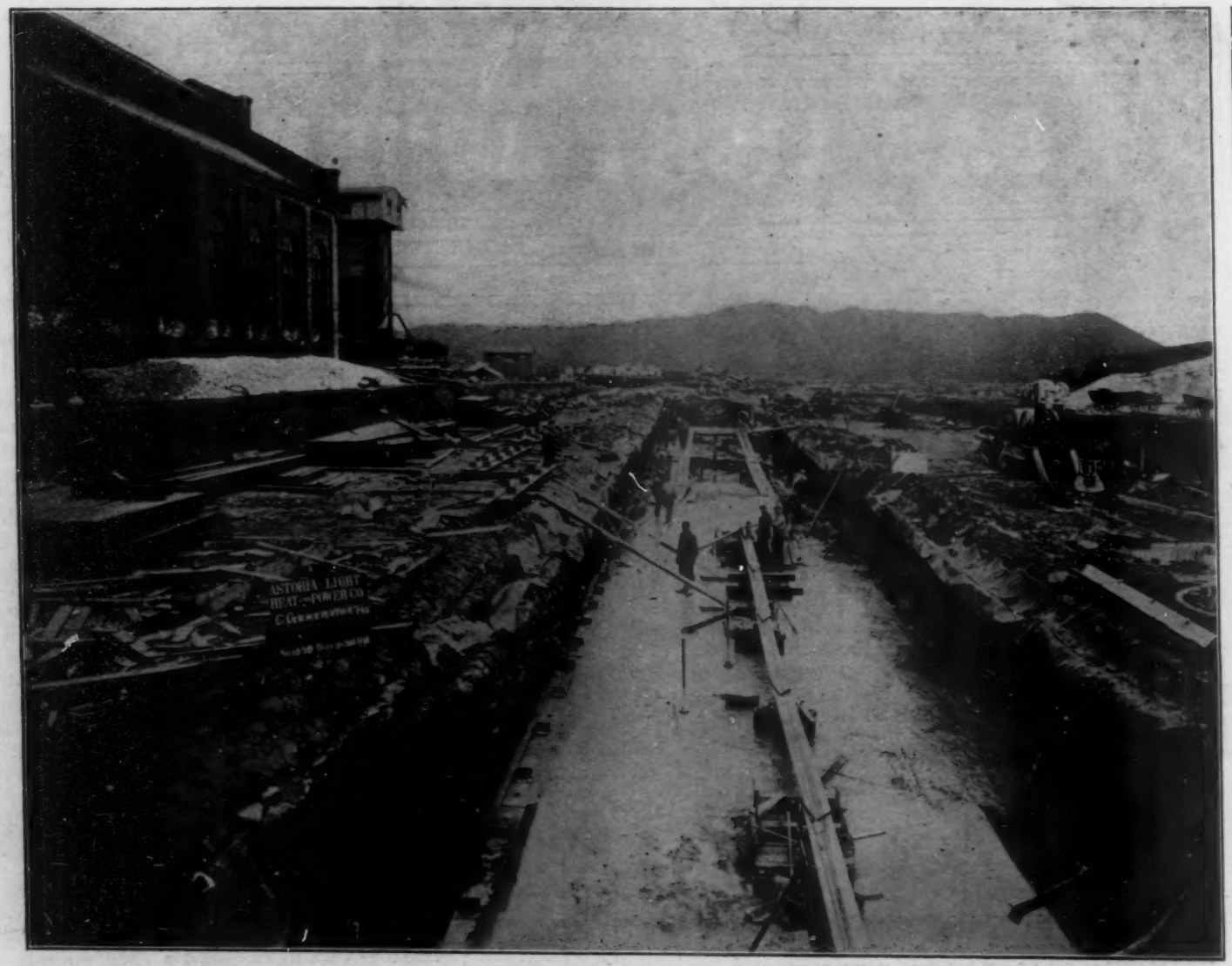

Fig. 70.

Fig. 71.

conceals most of the other buildings of the unit to which it belongs. On the right of the water gas plant is the completed shop and office building, and to the northeast of the latter can be seen the temporary material storage sheds.

But as one cannot show the whole plant in one photograph, it being too vast and expensive, so, let us take the different buildings, one by one, and see what progress has been made.

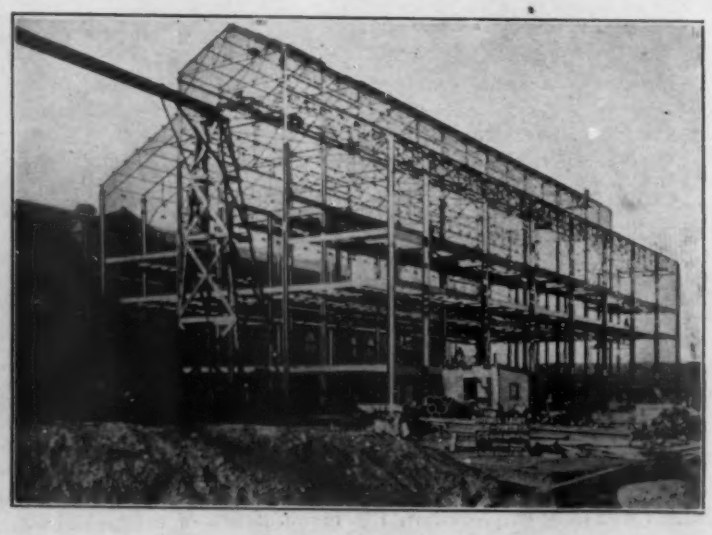

Fig. 77.

Fig. 77 is a closer view of the water gas meter house, which is practically ready for the roof filling. This building bears another title, however. Did you see the announcement early in June of last year that the "South Sea Scouts, Soul Stirring, Stupendous Stunts" would be presented for one night only at Woods & Morris, Inc., Hellgate-Zephyr-Swept-Casino-Beach Theatre? " Well; this is the place. And it takes a good-sized meter house to contain six 16 feet

Fig. 73.

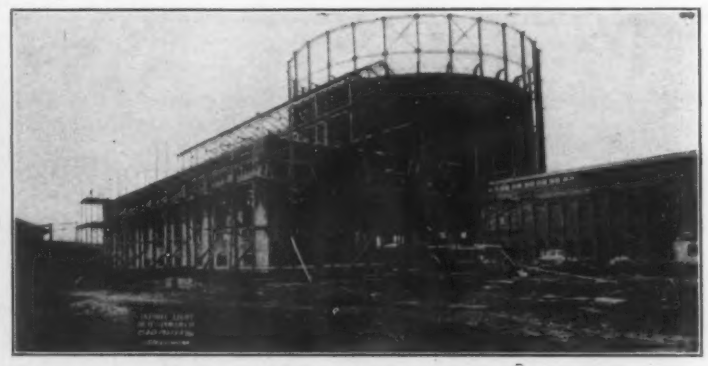

Fig. 77.

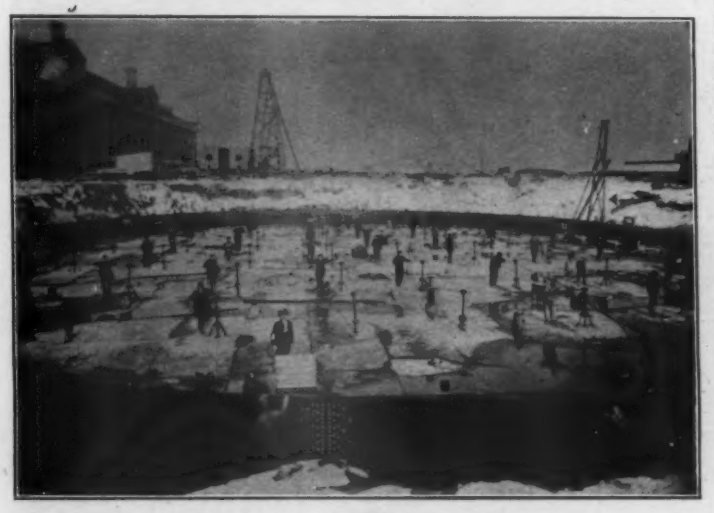

Fig. 74.

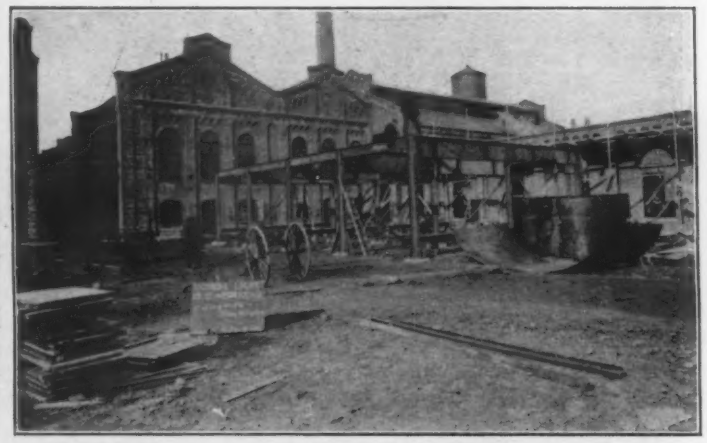

Fig. 78.

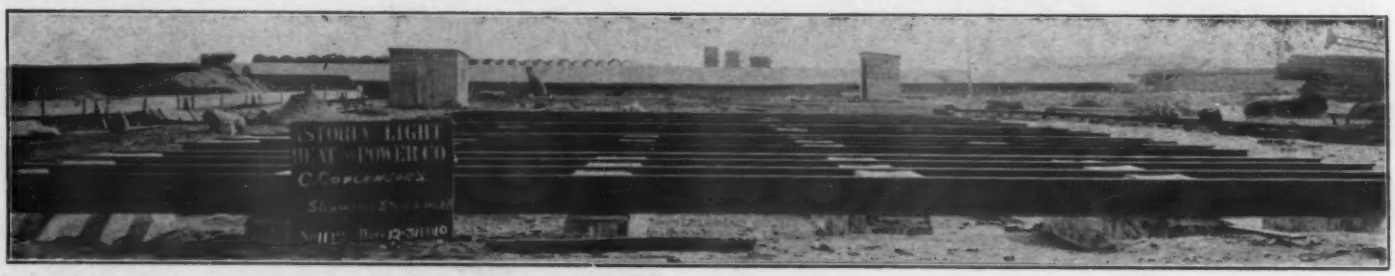

Fig. 75.

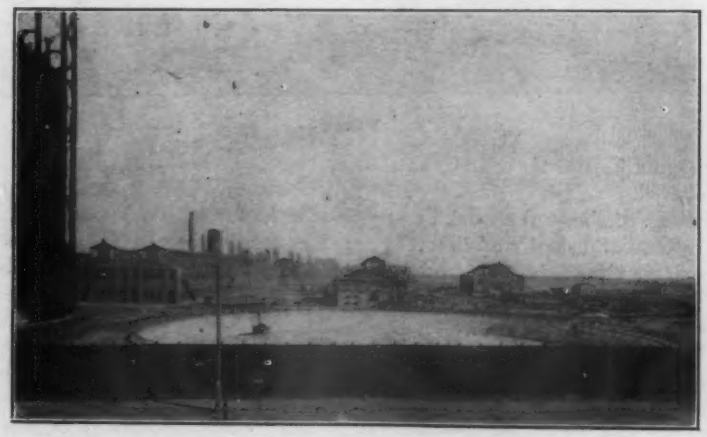

Fig. 76.

Fig. 79.

meters, and still leave room for a spectacle, second not even to the Hippodrome.

The shaving scrubbers, like the condensers, are not inclosed in a building. Fig. 78 shows the steel framework in place, ready for the erection of the scrubbers, and Fig. 79 (taken 3 months later) shows the apparatus completed. Each of the 8 scrubbers is 12 feet in diameter and 20 feet high; the combined capacity of the set being 32,000,000 cubic feet of gas daily. The shavings are charged into the scrubbers at the rate of 300 bushels per hour by means of a turbine-driven blower located in one end of the P. & A. tar extractor house. Approximately one-third of the space in this building is used for shavings, storage and handling. The P. & A. tar extractor house, partly completed, is shown at the right of Fig. 78.

Fig. 80 shows the interior of the water gas meter house, with the foundations for 12 meters completed; though, until such time as the

Fig. 80.

Fig. 81.

Fig. 83.

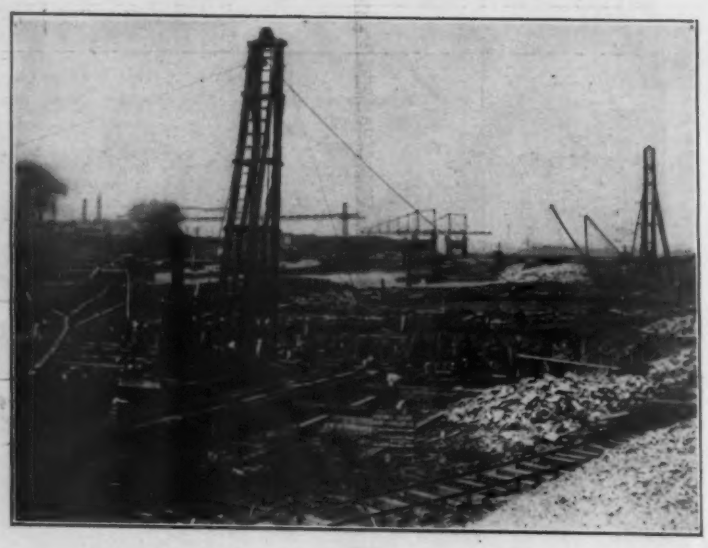

Fig. 84.

second half of the water gas unit is built, one-half only will be installed.

Fig. 81 shows the work in progress in the tar separator pit. Excavation is finished, and the reinforced concrete floor is being placed. A later view (Fig. 82) shows the steel separators in place (for the west half of the unit only), the general dimensions of the tanks seen here being 90 feet in length, 25 feet wide, and 8 feet 7 inches high. In the rear of the tar tanks can be seen the 5 salt water condensers, each 42 feet long, 10 feet wide, and 16 feet high, having 30 inch gas connections and 6-inch pipes for the salt water (taken direct from the river) and for the tar drain. One of these condensers is to be used as a feed water-heater for the waste heat boilers in the generator house. To the right of the condenser can be seen the completed generator house, the two holes in the upper part of the gable being for the two 48-inch take-off mains, while to the west of the generator house can be seen the water gas pump house.

Fig. 82 shows the boiler house with the steel work up, the stack nearly finished and also the boiler settings and coal hoppers. To the south of the boiler house is the exhauster house, completed except for

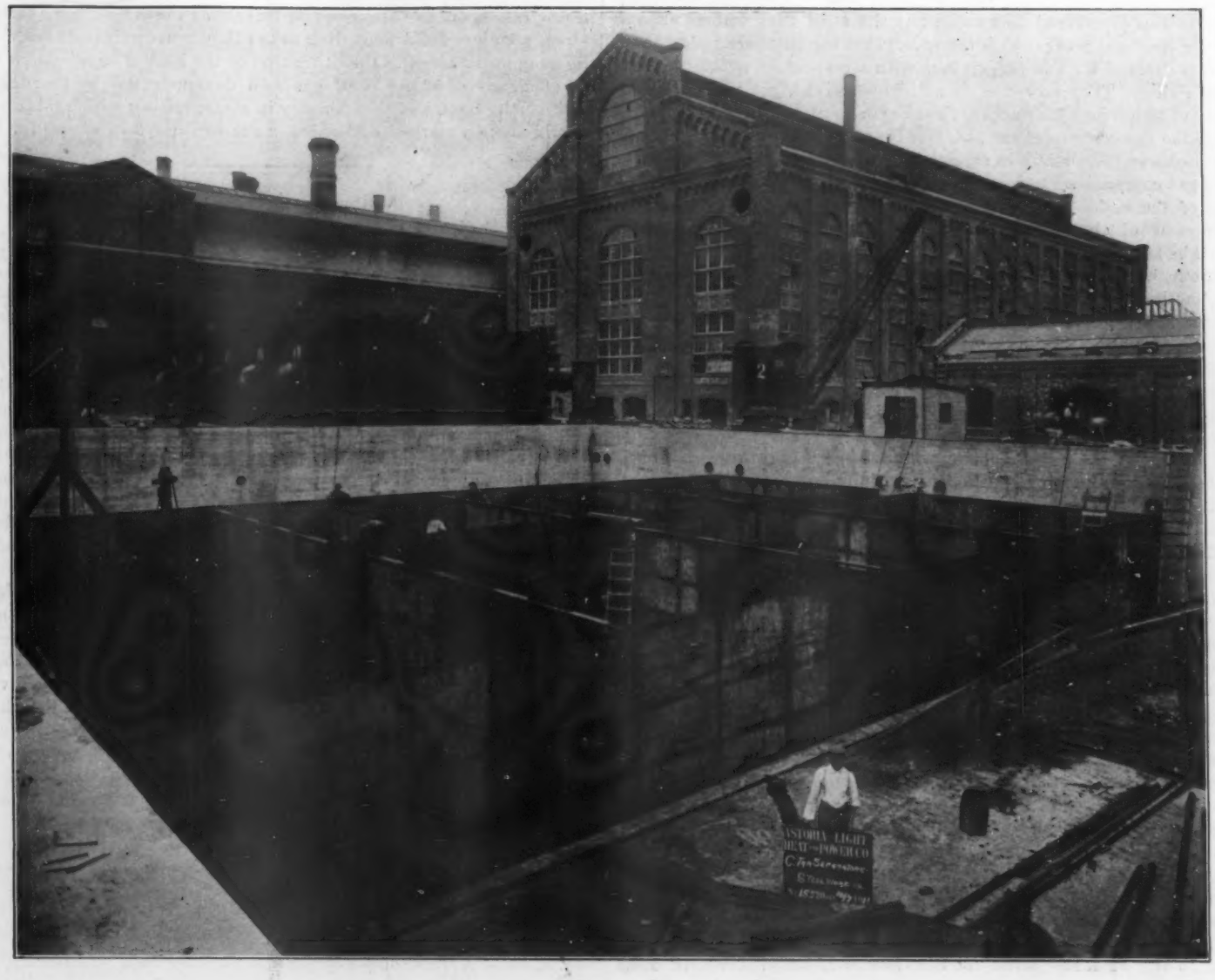

Fig. 82.

the roof-filling. On Berrian's Island (Fig. 84) the foundations are shown underway for the two immense oil tanks, the reason for their remote location being to remove the hazard of the tanks from the buildings of the plant.

In the background of this picture can be seen the coal unloading towers and storage bridge at work on the coal storage pile.

The Present Position of the British Gas Lighting Industry.

[By an "Occasional Correspondent."]

The lively contest between gas and electricity that is going on in this country continues to provide many features of interest, and that it is resultful is shown by the continued expansion of the gas lighting industry here. It is recognized that the future for gas lighting is largely bound up in cheapening production, and with many materials costing more it is recognized that every economy that can be effected in the way of working up residuals must be operated. For a long time now chemical manufacturers here have been annoyed with the gas companies over what they term unfair competition. This came to a fight recently, and a special committee of the two Houses of Parliament had to take up the matter.

The increased working up of ammonium sulphate also by about one-half of the gas works in the country had begun to affect the chemical manufacturers to a certain extent, and when a few of the largest gas works began to use the spent oxide from the sulphureted hydrogen purifiers for making sulphuric acid to work up the ammonium sulphate, the tar distillers and chemical manufacturers combined to ask Parliament to place restrictions upon the gas companies in inter dealing with each other in such residuals; that is to say, if a gas undertaking liked to work up these residuals it should be free to do so, but it should be debarred from purchasing residuals from other undertakings to work up with its own.

Before Parliament realized the meaning of such a restriction a clause to this effect was introduced in two or three bills, and a model clause was drafted; and had not the gas companies suddenly awakened to the fatal effect of such a measure it would probably have been introduced into all future bills. The "Gas Protection Association," however, petitioned Parliament on the subject, and a joint committee from the two Houses held an inquiry into the matter, with the result that they declined to impose any restrictions as to intertrading between gas companies in their own residuals.

The importance of this decision to the gas companies is of the most far-reaching character as regards the future, because if gas is to continue its steady progress in popularity as a fuel everything that can be done to lead to its cheapening should be striven for. Inasmuch as the increase in cost of raw materials and labor is tending rather in the opposite direction, every economy, no matter how small, becomes an important factor, and it is really upon the residuals that in the future the gas manager will have to depend for any possible cheapening of the gas.

Of course the question principally affecting the tar distillers arose out of the increasing use of tar employed as a coating in road making here. The good roads' movement, although late in arriving in this country, is now making fair headway, and the use of tar both for protective and in the dust raising purposes, is growing rapidly. As raw tar was found to disintegrate rapidly, it was then found desirable that the tar should be prepared for road use by first driving off all the water and distilling off the light oils. This meant work for

the tar distillers, but it was not long before the local municipal authorities discovered they could buy the stuff they wanted cheaper at the local gas works, with the result that tar distillers found themselves short of tar and face-to-face with a market in which the price was rising. They however, as will be perceived, got nothing in the way of help when they approached Parliament, and, generally speaking, the gas companies are now free to trade in gas and anything else they choose to work up in connection with the gas manufacture. If the gas companies had been trammeled by restrictions in the working up of the residuals no doubt tar distillers and chemical manufacturers would have been benefited. As it is, the price of residuals will be kept low owing to competition and the gas lighting industry benefited.

Another feature of 1912 has been the increase in the capacity of the carbonizing plants and vertical retorts have steadily advanced in favor. All the chief makers have put up important installations during the year and, besides the specially British makes, the Dessau vertical retorts, working on the intermittent system, which are highly favored on the European Continent, have also been installed in four important cities. The discussion of the relative advantages of the intermittent and continuous processes has continued, but the most interesting factor in the history of the contest will not be written until it becomes possible to make annual comparative tests between them with the same quality of coal under similar conditions. Efforts are now being made in this direction by the Carbonizing Committee of the British Institution of Gas Engineers, at Birmingham, where both the Dessau, Woodall and Duckham systems are erected.

The revival of the idea of liming the coal before carbonization, which has been carried out for the past 3 years at the Cheltenham gas works, is, as a writer in the London *Times* indicates, one that may develop into great importance. When this process was introduced (by Cooper, in 1882), it was with the idea of increasing the yield of ammonia from the coal; but, as modified at Cheltenham, where 2 per cent. of lime is thoroughly mixed with the coal as it passes from the crushers, and is caused to adhere to the surface of the small coal by a steam jet, it has been found to increase the yield both of ammonia and of gas, to lessen the number of stopped pipes, and to reduce the sulphur compounds in the gas to a very large extent without any serious injury to the coke. When the sulphur clauses were relaxed in order to permit of lime purification being dispensed with the idea in the minds of all concerned was that, according to the evidence given by Sir George Livesey, it would mean merely an increase in sulphur other than sulphureted hydrogen from the previously permitted 22 grains up to 30 or 35 grains per 100 cubic feet. This undoubtedly would have been the case at the temperatures used in the older methods of carbonization; but with the high temperature carbonization now in vogue it was soon found that the sulphur might exceed double this amount, and many companies very wisely continued a partial lime purification because, with an excess over the 35 grains of sulphur, a slight taint is noticeable in the air of a room in which much has been burnt and the effect of the sulphur soon makes itself visible on the metal work of inverted burners. If the Cheltenham process continues to show the same results it has been giving many companies will be willing to adopt it, not only for the slight increase in gas and ammonium sulphate made per ton, but also because they would get nearly the same purifying effect as in the old days of lime purification, and at the same time would not have to deal with the nuisance created by the residual material.

As regards the manufacture of coal gas in Great Britain during the past year the statistics in the British "Gas World, Year Book," show that there was an increase to the extent of 2.1 per cent., while the increase in the number of gas consumers, which is probably the truest indication of progress, is 5½ per cent., as compared with 4 per cent., in 1911. The makers of gas fittings had a prosperous year, and the demand for gas fires, cookers and water heaters grew largely, some manufacturers reporting increases in their turnover of from 75 to 100 per cent. In the manufacture of gas making plant the increase in the turnover is calculated at 15 to 20 per cent., and there promises to be a good deal of constructional work in the near future.

In the advances made in burning coal gas pressure has played an important part, and high pressure lighting on various systems is demonstrating the fact that it is possible in practice to obtain illuminating efficiencies with incandescent mantles in the neighborhood of 60 candles per cubic foot. For heating purposes an interesting development is to be noted in the Bone system of surface combustion. It will probably be found in days to come that Dr. Bone's work with regard to surface combustion will mark almost as important a stage in progress as did the discovery by Bunsen of the atmospheric burner. Already boilers fitted according to the Bonecourt principle are showing such an advance in the utilization of the heat of combustion that an efficiency of 92 per cent. has been demonstrated by thoroughly trustworthy tests, and the economy in steam raising which this means should make a marked difference in the consumption of gas for fuel purposes.

[Communicated by "M."]

Building a Gas Works: An 84-Day Job.

Barton Heights, Va., a town of several thousand progressive citizens, is situated within a 10 minute ride of the heart of the business section of the venerable old city of Richmond. With good streets, walks, city water and street car service, there remained but one thing to make it an ideal residential district for the overflow of the city on the James. Mr. L. I. Pollitt was the man to discover the fact that gas was the "missing link," and, armed with his ever-gracious manner and clever diplomacy, he presented his views to the City Council, who were brought to realize that gas would be a great benefit to the community in general as well as to the future welfare of the municipality. His proposition accepted, he at once proceeded to secure a site for the plant, and thus, with a temporary office and the goodwill of the citizens, the Henrico County Gas Company was born, the 7th day of August, 1912.

The first thing to do was to decide on a proper setting for the plant, taking into consideration railroad facilities, etc. This done, the next thing was to purchase the ground. Strangely enough, the owner of the chosen ground was found to be an old woman, to whom, through years of constant association, this particular spot had grown very dear. Here she had lived surrounded by her children, and her children's children, most all her life; and, naturally, all this conjured reverence lumped itself together and rose as a great obstacle to the selling of the property. However, the land was finally purchased and the Company was ready to start work. Advertisements were inserted in the daily papers for 100 laborers, and in response to these the very gratifying number of 3 negroes presented themselves for work. Nevertheless, with these three, work was started on the distribution system, and a full force of workmen was gradually acquired.

On September 17th the quantity of 300,000 cubic feet of earth had been excavated from the plant site and the first brick was laid. Notwithstanding the fact that all material was greatly delayed in transit, and unavoidably delayed for various other reasons, work progressed admirably. And not the least of worries was the construction of a railroad siding. To begin with, a fill of 40,000 cubic yards and the construction of a standard, concrete, steel bridge, with a 40-foot span, were necessary.

At the same time, the building was progressing and the water gas and other machinery began to arrive. The water gas set was erected before the building was roofed or the floor laid.

The plant equipment consists of 2 steel tank holders, one single-lift, with a capacity of 30,000 cubic feet, and 1 steel tank, inner-section gasholder, with a capacity of 50,000 cubic feet (fixed for future extensions), one No. 1 "A" United Gas Improvement Company's standard, double-superheater Lowe water gas apparatus, with steam and air meters and pyrometer, and having a capacity of 150,000 cubic feet of gas per 24 hours (with provisions made for a future 6 foot set), two Terry 21-horse power steam turbines, with a normal rating of 3,500 revolutions per minute; two 40-horse power, economical type, horizontal return, tubular Erie boilers, one Dean boiler feed pump, two Kerr Murray Manufacturing Company's No. 3 exhausters, one Dean low pressure tar pump, two Davison simplex oil pumps, one set of steel plate purifying boxes, 15 feet in diameter and 10 feet high, with 10-inch duplex valve and connections; one oil storage tank, 14 feet in diameter by 14 feet high, having a capacity of 16,000 gallons; one 6-foot Hinman patent drum station meter, and one 10-inch Connelly automatic governor. The holders were erected by the Kerr Murray Manufacturing Company and are a creditable piece of structural work. The yard lines, of 10-inch cast iron, are arranged to by-pass either holder.

The building is a 2-story brick structure, with a second floor of reinforced concrete in the boiler room for coke storage. It rests on a foundation of concrete. The walls are 13 inches thick. The roof is of galvanized iron, asbestos protected, and has two 30 inch ventilators. The floor is of concrete. The plant in its entirety is a model of

modern achievement, with every equipment for efficient operation and designed for future extensions.

A tar separator (of concrete) was designed and constructed so as to take care of the tar from the holder drips and the seal pots from the water gas machines. A drainage system was also laid out to take care of all surface water, drippage and overflow from the tar separator, draining into a main sewer line which empties into a nearby creek.

The water supply is furnished through a 2-inch main laid by the Company and connected with the town's main just above the plant. The general plan and the photographs shown herewith convey a very good idea of the entire layout.

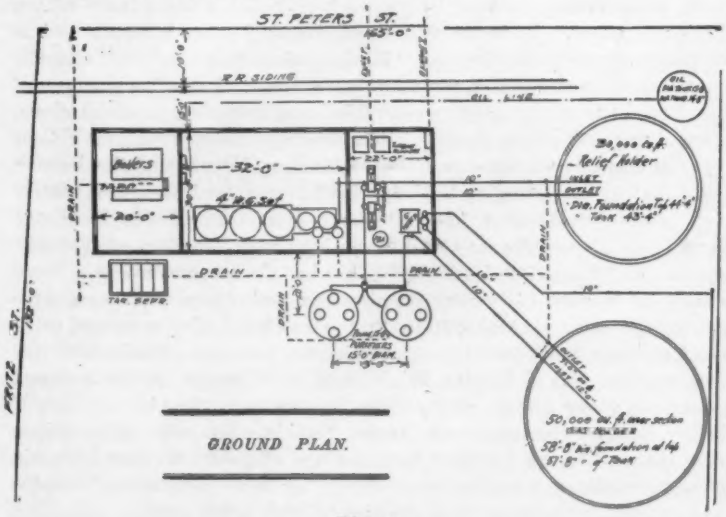

Fig. 1.

Fig. 2.—Front View.

Gas was turned into the mains, December 9th, 1912, and on the 10th of that month 3 families were cooking with it. On January 9th 75 applications had been made, of which 52 had been taken care of.

At the present time 7 miles of mains have been laid, and the Company is serving, in addition to Barton Heights, Norwood, Battery Court, Battery Court Addition, Brookland Park and Parkland.

The Company is now installed in a new and up-to-date office building, and is getting new business faster than the force of workmen can handle it. Most every citizen in Barton Heights and the surrounding territory admits that gas put the vicinity on the map in 84 days.

Mr. Edward L. Rieha, of Baltimore, Md., was Engineer and Designer; Mr. F. L. Marshall was Superintendent; and his assistant (Wm. H. Matlack, Jr.), was in charge of the construction. Mr. L. Irving Pollitt, whose earnest endeavors and conscientious management helped so materially in the success of the enterprise, is General Manager of the Company.

Mr. A. S. B. Little, General Manager of the Consolidated Gas Purification and Chemical Company, of Nashville, Tenn., writes us that the demand for the Little booklet, giving "Little Hints on Purification," has been so great that, while the Company will cheerfully furnish a copy to anybody who writes for same, without charging therefor, additional copies to the same address will be billed at 50 cents each.

The Possibilites of House Heating by Artificial Gas as a Fuel.

[A paper prepared by Mr. A. F. Krippner, Industrial Engineer, Laclede Gas Light Company, St. Louis, for the Eighth Meeting, National Commercial Gas Association.]

The purpose of this presentation on the "Possibilities of House Heating by Artificial Gas as a Fuel" is to present the results of experiments, investigations and observations made under the direction of the writer in St. Louis, during the heating season 1911-12. The discussion will include the various methods of application of gas fuel, some tables and curves based on carefully collected data, a word as to the possibilities of its more general use for house heating purposes and other points that may be of interest to the gas industry.

House heating by artificial gas used in a central heating plant is of comparatively recent origin. There is no data at hand by which its beginning can be definitely established, but it is known that for the past few years this method of heating has been employed in a few scattering cases. A couple of plants, each consisting of a battery of manually controlled water heaters, connected in a parallel to the heat distributing system, were installed by the Gas Company in homes in St. Louis 8 years ago, and, notwithstanding the fact that the cost of operation has been somewhat excessive, these plants have given good satisfaction to the customers, and have been a source of desirable revenue to the Company. The present state of development in St. Louis may (quite correctly) be said to have had its most definite beginning in the heating season of 1908-09, for at that time the Company made the first of its thermostatically controlled installations, making it possible to render more nearly the ideal heating service. Subsequent years brought their small quota of house heating customers, enabling a more careful and intelligent observation of the practicability of the scheme, so that, by the summer of 1911, the efforts in this direction were receiving sufficient support from satisfied customers to warrant a more extensive investigation during the season 1911-12. This investigation was entered into with the idea of developing the house heating field as a portion of a broad policy of building up the Company's wholesale business, with particular reference to securing a summer load by offering proper inducements to the large manufacturing industries during the portion of the year when the sales' curve shows its greatest depression.

It became apparent at the outset that, in order to assure a more general use of gas for the purpose of house heating, it would be necessary to determine the best and most economical method of application. The installations utilized for the collection of data consisted of a number of hot water systems equipped with the various types of heaters available, one coal burning heater converted to gas by means of burners installed in the firebox, one hot air furnace equipped with burners, and one individual gas radiator system. All heaters were equipped with pilots and placed under thermostatic control so that the regulation of the fuel became directly dependent upon the temperature in the house, thus insuring an economy in operation which cannot be realized in manually controlled systems. Separate meters were placed for all plants, readings were taken daily, any troubles and irregularities were recorded by the man taking the daily readings and, wherever possible, he made corrections and adjustments while on the premises. The daily average outdoor temperatures were secured from the United States Weather Bureau.

A number of difficulties were experienced in the beginning of the season. These troubles consisted chiefly in matters of mechanical detail, relative to the proper operation of cut-off valves actuated by the thermostat motor, and the correct drilling, adjusting and proportioning of burners used in the heaters. Some little experimental work eliminated these obstacles in a very satisfactory manner. The hot air furnace, however, proved so highly inefficient that some changes were necessary for a greater conservatien of heat, and it may be of interest here to go more into the details of the changes and the resultant operation of this particular system. The installation consisted of two 28-inch furnaces, connected as a single unit, in a new home built during the summer of 1911. Two concentric ring burners, with mixers on the outside, controlled by a thermostat and lighted by a pilot, were placed in the firebox of each furnace. Due to the inefficiency of the heating plant, as constructed by the manufacturer, it was fully demonstrated in a couple of months that the heating capacity was quite inadequate, while the cost of operation would go far beyond reasonable limits. An economizing device was

(*Continued on page* 98.)

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NOTICE TO ADVERTISERS.

New Advertisements and changes of copy therefor should be in hand Wednesday noon of week prior to date of issue.

NEW YORK, MONDAY, FEBRUARY 10, 1913.

[Official Notice.]

Forty-third Meeting, New England Association of Gas Engineers.

New England Association of Gas Engineers.
Office of the Secretary,
January 23, 1913.

The Forty-third Annual Meeting of the New England Association of Gas Engineers will be held at Youngs' Hotel, Boston, on Wednesday and Thursday, February 19th and 20th, 1913.

The meeting will be called promptly at 10 A.M., Wednesday. The programme for that day is:

Lecture on "Electrolysis," by Prof. A. F. Ganz, at 11 A.M.

Paper on "Accounting," by Mr. F. P. Royce, at 2:30 P.M.

"Notes on Chemistry of Gas Coal," by Mr. Edward F. Wilson, at 4 P.M.

Members will dine together Wednesday evening. Please bear in mind the importance of prompt attendance at the sessions.

Thursday.

Paper on "Coal Gas? Surely: But How?" by Mr. R. P. Brown, at 10 A.M.

Paper on "Gas Lighting," by Mr. R. F. Pierce, at 11:30 A.M.

Material for the "Question Box" should be sent in to the Secretary as early as possible.

Applications for membership should be in the Secretary's hands before February 18th.

All friends of the Association are cordially invited to attend the meeting.

N. W. Gifford, Secretary.

BRIEFLY TOLD.

Mr. H. Thurston Owens Accepts New Duties.—Mr. H. Thurston Owens, whose direct connection with the Journal's editorial staff dates from January 1, 1911, terminates that connection with the current issue. It goes without saying that we regret this determination, for his relations with the proprietors and the general management of the Journal have been of the sort that may not be sundered without one knowing that something untoward has happened. However, an opportunity of engaging practically in active work in the lighting field, under material conditions that acted largely as a determining factor, looked so inviting that it could not be denied. To-day he takes up the duties connected with the post of General Manager of the La Crosse (Wis.) Gas and Electric Company; and we assuredly and heartily hope that his success in this new field will be as great as is the enthusiasm with which he enters it. It will (and that he knows to a certainty) not be a berth whose lassitude leads to languor; so all the more credit to him when he succeeds, by force of intellect and dint of will, to clear the field for better and larger commercial planting. Mr. Owens' first try in the lighting field was made in 1901, in which year he became attached to the distribution division of the business of the Central Union Gas Company, Borough of the Bronx, N. Y. Later he was appointed to a responsible position in the lighting department of the city of New York. On January 1, 1911, he became Associate Editor of the Journal, and has also been concerned with consultation work along gas lines. He is a graduate of the Practical Class, American Gas Institute, and also took the Johns Hopkins course of lectures on "Illuminating Engineering." He has contributed frequently to the technical press, and has freely given of his thought to the proceedings of various gas and electric associations. He is a member of the Board of Educational Control, National Commercial Gas Association; is a Corresponding Member of the British Illuminating Engineering Society; is Chairman of Paper Committee, New Jersey State Gas Association; is Secretary of the Publicity Committee, Pennsylvania Gas Association; and Secretary of the body known as "The Gas Meeters." The La Crosse corporation, with which he is now identified, supplies gas and electric currents, also hot water from a central station to the residents of the named city. The Company was recently acquired by the American Public Utilities Company, of Grand Rapids, Mich., and is a factor in the general operations along public utility lines that are conducted by the Messrs. Kelsey-Brewer Company, of Grand Rapids. He assuredly retires from the staff of the Journal with the best of good thoughts from his former associates, who join in wishing for him success in his new field in measure to that which he would wish for himself.

New England Section, the "Gas Meeters."—"W.," writing from Boston, Mass., under date of the 3d inst., says: Dear Journal—No doubt you will be interested in being informed as to the thorough success of the first dinner of the New England Section of the "Gas Meeters," which was served in the City Club, the 30th ult. There were 57 representatives present, some of whom had journeyed many miles to share in the happenings; and everyone voted the affair an estimable success. Mr. Frank M. Roberts, of Haverhill, Chairman, directed the proceedings. Good, forceful addresses were made by Mr. I. W. Peffley, of the New York Section; and by Mr. T. H. Piser, Mr. T. J. Potter, Mr. Geo. E. Harris and others. "The Only," in fact "The Inimitable" "Will." Guitteau was on hand with that "full meoner physiognomy" beaming mirth and humor, with eyes and voice, while retailing a story or two that had both pith and point. The dinner itself was excellent, and was satisfactorily served; the adjunct of music giving the finishing touches to the harmony of the occasion. A telegram announcing how matters were going on was sent to New York, and the "big city" folks went one better by sending their acknowledgments and good wishes via long distance telephone. There can be doubt that this Section will be a "go" from the outset.

Gas Booklet for Architects.—Some time ago the Pennsylvania Gas Association appointed a committee charged with determining ways and means of co-operating with architects in respect to seeing to it that structures in process of planning, whether these were for public or private operation on any and all accounts, were properly piped for gas, and so on. The Committee having attended to its duty, and having followed out the tentative instruction given it, has (through Secretary W. O. Lamson, Jr.) made the following report:

Pennsylvania Gas Association,
Office of the Secretary,
West Chester, Pa., Feb. 6, 1913.

To the Members, Pennsylvania Gas Association: The Committee appointed to prepare the booklet to be presented to the architects, report that the booklets will soon be ready for distribution. You are doubtless familiar with the scope of this work, and the valuable book of reference it will be to the architects as well as to the members of the gas fraternity. It is, therefore, requested that the Gas Companies in this Association purchase copies of the "Leather-back" Edition for each Architect in their territory, and see that the copies are presented to the Architects free of charge. It is also urged that the Gas Companies purchase a sufficient number of the "Cloth-back"

copies to furnish each employee with one, and keep a supply of the "Paper-back" copies on hand for distribution to builders and prospective home builders. The prices to be charged the members for these booklets, are as follows:

Edition.	Price.
Paper-back	10 cents each.
Cloth back	25 " "
Leather-back	$1.00 each.

The prices do not include forwarding. Please send your requisitions to the Secretary as early as possible, that your name may be placed on the list for the number of each edition of the "Booklet" required.

THE WESTCHESTER (N. Y.) LIGHTING COMPANY AND ITS MEN.—The Westchester Lighting Company some time ago arranged for a series of meetings for the employees of the several districts that it covers. So far these meetings have been held in the Elks' Hall, Mount Vernon, and thus far have been well attended by the employees. The usual programme followed has been an introductory speech or discourse by some gentleman well versed in his subject, which literary number was followed by an entertainment. The last meeting, which was held in the usual place the evening of Thursday, the 30th ult., was attended by about 500 of the employees, including a number of the ladies connected with the Company's cooking and gas appliance division. This was the first meeting attended by the weaker sex, and from their demeanor it was evident the first session will not be the last. The speaker of the evening was Mr. W. D. Kelley, General Superintendent of Meters, Consolidated Gas Company, New York. His talk was not only interesting but instructive; further, it was appreciated. The mental part of the proceedings was followed by a minstrel performance, the performers being from the Yonkers' shop of the Company's territory. Their efforts were first class, and the fine performance was rewarded with round-after-round of applause. Perhaps the greatest artist was Mr. E. O. Baxter, Chief Clerk of the Yonkers' office. At the close of the entertainment, refreshments were served, and a fraternal exchange of experiences pleasantly ended a most enjoyable session. For much of this story we are indebted to the attention of Mr. Chas. Otten.

CURRENT MENTION—

DESPITE all the prior denials that negotiations for its taking over were even underway, the United Gas Improvement Company has taken over the properties of the Philadelphia Electric Company on a 99 year leasehold, at a guaranteed rental of 8 per cent. per annum on the new paid up capital. The U. G. I. also assumes the Philadelphia Electric's fixed charges.

THE St. Paul (Minn.) Gas Light Company has filed its annual report with the City Comptroller. The net earnings for the year were $195,214.65, and 31,572 customers are on its gas rolls, 6,918 are on its electric listings, and 18 take steam from it. The Company's employees number 695.

CONTRACTORS should keep their eyes well lined-up in the direction of Cincinnati, O., in which city within the next 2 years at least 3 millions of dollars will be expended in the construction of a gas plant that will be somewhere in keeping with the gaseous demands of that city. First Vice President Ernst is a practical business man, and he full well knows that gas (natural or otherwise) as it is at present supplied in the Queen City is not far from a farce.

JUDGE SMITH MCPHERSON has issued a temporary writ restraining the City Council of Oskaloosa, Ia., from enforcing an ordinance whereunder the Oskaloosa Light and Fuel Company was ordered to reduce its selling rate to $1 per 1,000 from $1.35. The case will be tried early this month.

SOME days ago papers were filed announcing the incorporation of the Schniewind Coke Oven Company, of Hartford, Conn. The incorporators are: Robt. C. Metcalfe (Newark, N. J.); and Alvan Waldo Hyde and Chas. Welles Gross, of Hartford. It is capitalized in $500,000.

THE proprietors of the San Diego (Cal.) Consolidated Gas and Electric Company have applied to the California State Railroad Commission for permission to issue bonds amounting to $204,000, the proceeds to go to the redemption of the Company's floating debt.

DURING the month of December, 1912, the gross earnings of the Fall River (Mass.) Gas Works Company amounted to $41,781, a gain of $2,023 over the corresponding month of 1911. The net earnings are returned at a gain of $793 for 1912, as against those of 1911.

AT the annual meeting of the Ludington (Mich.) Gas Company the officers chosen were: President, Charles N. Remington; Vice-President, Andrew Fyfe; Treasurer, H. L. Adzit; Secretary, Chas. A. Coy.

ELECTRICAL baths are assuredly one of the features of the new club house, located in the premises 113 East 12th street, city, of the Association of Employees, The New York Edison Company. The House was formally opened, with a huge attendance and much enthusiasm, the afternoon and evening of the 4th inst. All of its 3,000 members may now avail themselves of the benefits of "electric bathing," along with the other privileges which the new club house offers. These include bowling alleys, a music hall, billiard and pool rooms, and a library of 1,800 volumes. Mr. William T. Dempsey, who has charge of all of the city's street lighting that is done by means of electric current, is President of the Association. The chief objects of the latter are welfare and educational work, and its members may avail of the benefits of a 4-year course in electrical engineering under the tuition of thoroughly competent teachers without any charge therefor. A completely fitted and equipped laboratory is a feature of the Club's possessions. Owing to its complete fitting-up with electrical equipment the new Club House might fairly be called "The Electrical Club House."

AT the annual meeting of the Central Hudson (N. Y.) Gas and Electric Company the Board of Directors was re-elected, save for the naming thereon of Mr. H. S. Reynolds. The Board later on perfected the following executive organization: President, T. R. Beal; Vice-President, John L. Wilkie; Treasurer, William Schickle; Secretary, P. A. Burns.

THE Hastings (Neb.) Gas Company has submitted to City Councils a proposition, to be balloted on by the voters during the April municipal election, which will grant it a franchise to run for 25 years, in consideration of the following rate reductions: $1.25 to $1.65 per 1,000, until annual production reaches 30,000,000 cubic feet; over thirty millions, $1.25 to $1.50; over forty, $1.25 to $1.40; over fifty, $1.20 to $1.30; over seventy-five, $1.20.

Publications.

[All Publications, Catalogues, etc., mentioned below, are kept in our office for the convenience of our patrons.]

"*Catalogue No. 12 9.—Hunt Noiseless Bucket Conveyor.*"—This is the title of an attractive 64-page catalogue recently issued by the C. W. Hunt Company, West New Brighton, New York. It describes a number of prominent and interesting installations, in which this bucket type conveyor is used for handling coal, ashes, phosphate, rock, cement, etc. Details are given showing the superiority of the pivoted bucket construction, and the advantage of the peculiar pawl drive used is pointed out. A number of illustrations are also afforded, which show numerous types of Hunt cut-off valves for use in coal chutes. Engineers who have anything to do with the handling of coal or other bulk materials can secure a copy of this catalogue, by addressing the Company as above.

"*Light: Its Economic Use and Advantages.*"—A series of articles now being published, on lighting by the Safety Car Heating and Lighting Company, in its monthly Bulletin, "Safety News." The January number includes an article by Mr. C. E. Clewell, of Yale University, which shows the changing viewpoint which is demanding a much more intelligent use of all artificial illuminants, in the factory as well as the home. The Company is the pioneer one in high pressure gas lighting, having developed in this country the Pintsch system for car lighting, a development that covers many years. The Company also supplies electric train lighting equipments.

"*Handbook on Incandescent Lamp Illumination.*"—A valuable and compact handbook (vest-pocket size) of 150 pages, bearing the above title, has been published by the General Electric Company. It contains a dictionary of terms, formulae, data on photometry, illumination, calculations and requirements, also on the operation of lamps and apparatus. A very wide field is cleverly covered in a concise and readable manner, and will undoubtedly bring credit to Messrs. Page, Stickney, Schroeder and Ashe, of the Harrison (N. J.) Works of the Company, from whence it is issued.

"*Rochester (N. Y.) Gas and Electric News.*"—This monthly publication of the Rochester Railway and Light Company continues along the same lines of useful endeavor that were laid down in its initial numbers. The one for January announces a prize contest for articles on "Accident Prevention," the results of which will no doubt prove helpful to many without, as well as within, the ranks of the Company's employees.

(Continued from page 95)

then installed in an effort to utilize heat that was otherwise lost in the flue gases. This economizer consisted of fifty 2-inch by 2-inch by 66-inch tubes made of galvanized sheet metal, sealed into a header at each end, then placed transversely into the cold air duct leading from the out-of-doors into the furnace. The flue gas was then conducted from the furnace through the economizer, on the inside of the square tubes, and on to the stack. The ventilation was controlled by a damper placed in the flue pipe on the chimney side of the economizer. The fuel economy was at once apparent, the consumption in days of equal temperature showing a decrease of from 35 per cent. to 40 per cent., and it was possible to supply sufficient heat to the residence throughout the unusually severe season without providing additional burner capacity. Temperatures taken at various points of the system showed the following results:

Varying Temperature Points.	Degs. F.
Temperature of outside air	26
" of flue gases leaving furnace	460
" of flue gases after passing economizer	160
" of fresh air between economizer and furnace.	100
" of heated air going to room	190

This indicated a drop of 300° F. in the flue gases and an increase of 74° F. in the incoming fresh air. It shows, also, that the heated air ready to go to the various rooms was 30° F. higher in temperature than the flue gases after leaving the economizer. Inasmuch as the products of combustion are cooled to a point considerably below 212° F., it is possible, by this method, to utilize the gross heating value of the gas, due to the condensation of the moisture contained in the burned products. To provide for this condensation a small pipe was placed in one end of the economizer and extended to a sewer opening in the floor. In this residence the more distant rooms were heated by a hot water system, the heating coils of which were placed inside the hot air furnace. Because of the intermittent application of heat in the furnace these coils proved inadequate, and an auxiliary gas heater, built locally and automatic in its operation, was connected to the hot water portion of the heating system. The arrangement proved very satisfactory, in that all distant rooms were kept comfortably heated, independent of the hot air furnaces. It should be borne in mind, however, that the hot air furnace, though rendered comparatively efficient by the introduction of the economizing device mentioned, offers a rather limited field, due principally to the manner in which it is constructed. It is highly probable that few furnaces, after some years of operation on coal fuel, will maintain sufficient mechanical perfection to prevent the communication of the products of combustion into the fresh air chamber. It is true, to be sure, that a condition as just mentioned would be more obnoxious with coal fuel than with gas fuel, but inasmuch as it is the purpose of the Company to render as near as possible perfect heating service, every care should be exercised to remove from the building all of the burned products. It is essential, therefore, to obtain fullest assurance that the furnace is in first-class condition, and, when found so, the method of conversion as described can be utilized, and with satisfactory results.

The principle applied to the converted hot air furnace was then adapted to the hot water system. the economizer being placed in the cold water return pipe at same point near the heater. In order to be assured of the exact conditions attendant upon this method of operation some interesting and valuable facts were determined by a special investigation of 30 days' duration. A copper tube heater, equipped with thermostat, pilot, pipe burners, damper, mercury seal valve and copper tube economizer, was placed in a well-built brick house of average size, and recording thermometers were placed as follows: One in the hot water pipe leaving the heater; one in the water return pipe on chimney side of the economizer; and one in the flue pipe on the chimney side of the economizer. These temperature charts show the interesting fact that the flue gases can be cooled to a temperature nearly that of the return water, and to a point considerably below the temperature of the water leaving the heater to go to the radiators. The relation of maximum temperatures was approximately as follows:

Water leaving heater.....170° F.
Water returning from radiator.....120° F.
Flue gases on chimney side of economizer.....125° to 130° F.

Here, again, the gross heat value of the gas is realized, due to the conservation of the heat of vaporization of the moisture in the flue gases, and it was fully demonstrated that the gaseous portion of the products of combustion, though cooled to a comparatively low temperature, can be successfully eliminated from the appliance without a draft other than that naturally induced by a properly constructed chimney. An inspection of the temperature curves will indicate that the rise in temperature of the outgoing water and the flue gases is simultaneous with the lighting of the burners. This rise in temperature is well defined, followed in about 15 or 20 minutes by a less sudden rise in the temperature of the return water, thus indicating clearly the time required for circulation through the shortest course in the radiating system. It is interesting to note, too, how abruptly temperatures drop when the source of heat is cut off, and the further fact that during the period of non-burning the return water is warmer than the air in the flue. This means that a quantity of heat is being lost through the flue pipe by virtue of the air passing through the heater and out-of-doors while the burners are inoperative. Though this loss is probably very small, yet it can be prevented by installing a close fitting damper which is operated mechanically in synchronism with the burners.

A table was prepared to show, if possible, the advantages of the economizer over systems of other type. The readings for one full month gave the following results:

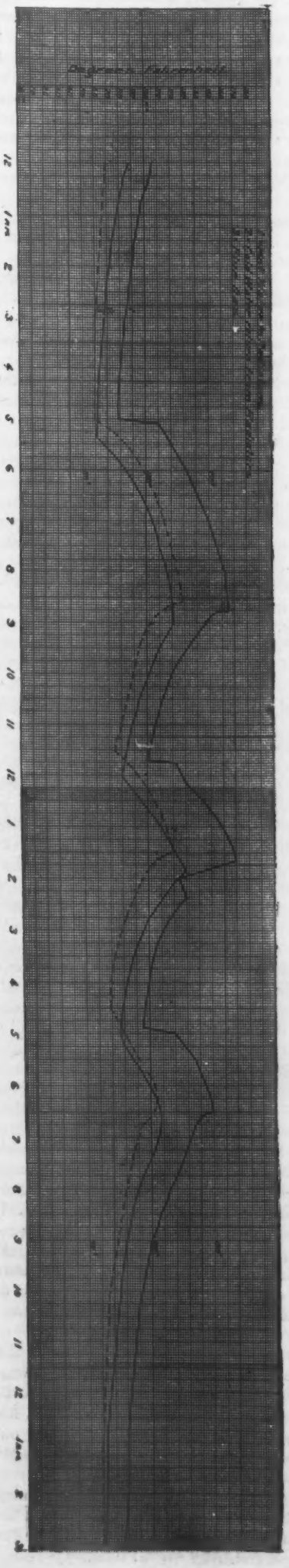
Residence Number.	Gas per Sq Ft. of Radiation.
1. Hot water system	109.6 cubic feet.
2. Hot water system	96.7 "
3. Hot air with economizer	91.8 "
4. Hot water system	90.7 "
5. Hot water system	118.7 "
6. Hot water system	87.6 "
7. Individual gas radiators	81.3 "
8. Hot water system	120.5 "
9. Hot water with economizer	76.02 "

This would clearly indicate the advantage of the economizer over the other systems. With this brief discussion of the principal mechanical features we will now pass on to a review of the data collected and the results they show. As already stated, a record was kept of the daily consumption of each plant. From these records it was possible to determine what may be termed the temperature consumption curves. A curve was constructed for each residence by the following method: Days of equal temperature, ranging from the coldest to the warmest, were grouped and the average daily consumption determined for each; then, plotting degrees F. horizontally, and cubic feet of gas per 24 hours vertically, a series of points was obtained approximating a straight line. The object of these curves is twofold: First, they indicate that the quantity of gas required varies directly as the outdoor temperatures; second, they may be utilized to estimate the quantity of gas required for temperatures other than those for which the curves were actually constructed. The second feature was used in arriving at the estimated consumption for heating during a season of "normal" or average temperature. The necessity for this reduction to a "normal" basis comes from the fact that the heating season during 1911-12 in St. Louis was unusually severe. This comparison of temperatures, as recorded at the United States Weather Bureau, will show the difference referred to:

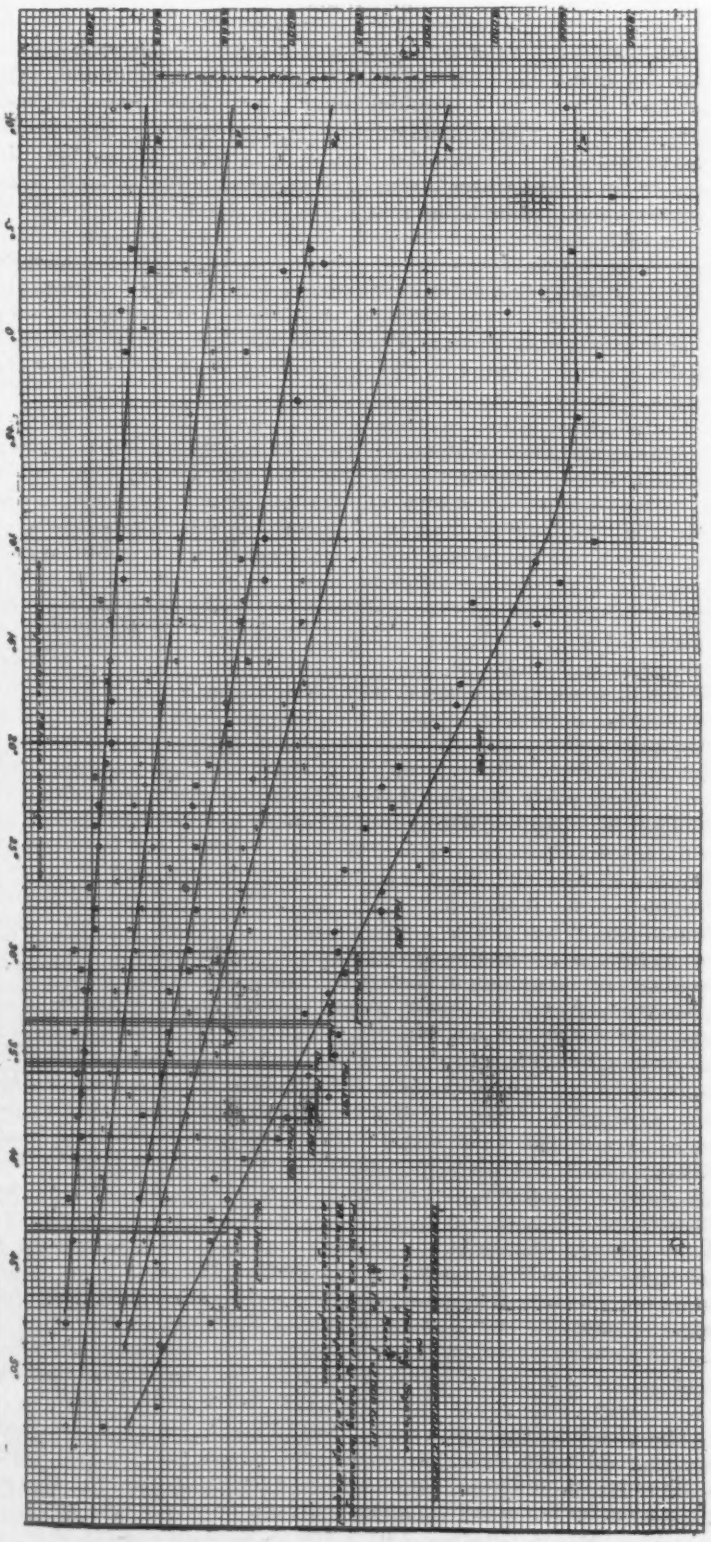
	Oct.	Nov.	Dec.	Jan.	Feb	Mar.	Apr.
Average monthly temperature, 1911-12	57	39	38	20	28	35	57
Avg. monthly normal temp. for a period of 39 years	58	43	35	31	33	43	56

The above table shows at once that, of the 5 principal months of the heating season of 1911-12, four were considerably colder than the average, while but 1 month was warmer than its normal temperature. Averaging these values the heating season of 7 months of 1911-12 shows a temperature of 39.14° F., while the normal temperature for these same months is 42.71° F., indicating a difference of 3.57° F. for the 7 months. If, however, the months of October and April be neglected, inasmuch as their averages are the same, and the 5 months only be taken into account, the difference in temperature becomes 5.2° F. instead of 3.57° F. During the days of extreme cold all houses heated by gas were kept comfortably warm, while many of the better type of homes heated by coal could not be kept at the desired temperature.

In order to make a satisfactory comparison of the various plants, an arbitrary formula was adopted by which all information might be reduced to a common basis. The square foot of radiation, based on the following formula, was assumed as a unit: Glass area, plus 1/10 net exposed wall area, plus 1/300 cubical contents equals the



Curves Showing Temperatures of Water Leaving Heater, Water Returning to Heater and Flow of Gas.



number square feet of radiation. Basement measurements are not included. By this method the quantity of gas per square foot of radiation per season was readily determined, and it was found, for the different residences, that the variation of this particular value was not beyond reasonable limits. By using the average consumption per square foot of radiation per "normal" season, it becomes a simple matter to estimate the heating cost of any residence or building, necessary allowance being made, of course, for structural conditions and for any local conditions which may be out of the ordinary.

In making final comparison of the cost of operation of gas against hard coal, all quantities were reduced to a "normal" temperature basis, and, with gas at 80 cents per 1,000 for the first 10,000 cubic feet and all excess at 50 cents per 1,000 monthly, it was found that the cost of gas fuel approximated twice that of hard coal at $8 per ton. It is well, perhaps, to state that in all residences, excepting one, the heating plant was located in the basement, thus affording an opportunity for warming that portion of the house and serving to keep the

flooring of the first story at the proper temperature. In the one residence excepted the individual gas radiator system, wherein the burning of the gas occurred within each radiator, was used. The products of combustion were exhausted at practically room temperature by means of a constantly operating electric exhaust fan placed in the basement. No provision was made to heat this basement. In another residence, where a similar system was installed later in the heating season, temperature readings taken at various heights in the room indicated a considerable difference in the heating of the regions near floor and ceiling; so much so that small children on the floor were in a comparatively cool atmosphere. A radiator was placed in the cellar to obviate this condition, and it is safe to assume from this that heat radiated into the basement is not lost, but, on the other hand, is essential to the health and comfort of the occupants of the house.

Househeating by artificial gas offers a number of advantages that readily appeal to the customer. Briefly stated, these advantages consist of absolute cleanliness in the house and atmosphere, a uniformly even temperature, automatic control, heat in any quantity and at any time, and freedom from janitor troubles. All these advantages are more highly appreciated by the customer than one would at first suppose. One good housewife in whose home some changes in the gas heating system this fall made necessary the firing of the coal heater for a few days complained vigorously of her dissatisfaction with the old method, but reverted promptly to her former condition of contentment upon learning that the gas heater was again in full operation. In another instance, a woman in whose home the system operated well during the past season, most highly recommended it because of its automatic control and its absolute cleanliness. One man stated to a friend that it proved more expensive than coal, but that his home had never been so evenly and comfortably heated as during the past winter, and another expressed his willingness to forego the pleasures of his automobile rather than give up his gas heater. Thus it may aptly be said of gas for househeating that the old adage that "Cleanliness is next to impossible" is made a misnomer of the past. Like the manufacturer of a prominent automobile in advertising his car, you simply have to "Ask the man who owns one."

Referring now to the possibilities of heating houses with artificial gas, the fact that the Laclede Gas Light Company will supply, for the present heating season, gas fuel for the heating of about 70 buildings, including residences from the smallest to the largest, a few stores and offices, and a couple of medium-sized factories, leads to the belief that this particular field is worthy of fullest exploitation. That the opportunity for this class of service to the public is large is beyond reasonable doubt, and it is an interesting fact that, after it was announced, a special rate would apply to house heating gas in St. Louis that approximately 600 inquiries were made at the Company's office during the brief period of 3 or 4 weeks. The daily press, in its editorial column, enthusiastically supported the movement, the smoke abasement league gave its hearty approval, architects submitted plans and specifications for information relative to costs for new houses in process of construction, manufacturers of, and dealers in, house heating appliances made careful inquiry into the merits of the scheme and displayed a most reassuring interest. From several sources, therefore, came encouragement which, perhaps, had been little expected, and even though all the obstacles in the way of applying gas for house heating more generally have not been entirely removed, there is unquestionably a bright, illuminating ray of hope to lead us farther into this distinctive departure in the gas industry.

It is quite in keeping with the spirit of this discussion, no doubt, to refer briefly to the most excellent Report of the Committee on Utilization of Gas Appliances, of the American Gas Institute, respecting its "Proceedings" at its annual convention in Atlantic City, October, 1912. Referring to "Gas Room Heaters" this report states: "The use of gas for heating rooms grows apace and, with the gradual reduction in the prices of gas, this use is probably destined to increase until the quantity of gas used for this purpose forms an important item in the total output. The conditions under which gas is used for room heating in this country are such that your committee believes it is warranted in devoting considerable space to an examination of the principles and methods employed.

"The heating of residences exclusively by gas, by means of a heater located in the basement, is, *at current prices for gas, rendered impracticable by the high cost as compared with heating by coal.* This method is practiced to a small extent, but not sufficiently, in the opinion of the committee, to warrent a further discussion at this time."

This peremptory statement at once surrounds one with an atmosphere of grave doubt as to the feasibility of even giving serious consideration to the subject of heating through a central plant, though it is really the most practical and the most hygienic method. Indeed, one who has inquired thoroughly and carefully into the facts, as actual operating conditions present them, cannot concur in that portion of the report of the committee. It is fully conceded that gas at 50 cents per 1,000, will cost in excess of hard coal, approximately, as nearly as can now be determined, from 85 per cent. to 100 per cent. increase. On first thought this may appear rather extreme, but it should be remembered this figure does not take into consideration any of the costs incident to janitor's service, handling coal and ash, the value of cleanliness and personal comfort about the home and other advantages, all of which can reasonably be reduced to a monetary value. Not so many years ago illumination by gas, as compared with the cost of coal oil, appeared quite beyond reason, while those advocating gas for cooking and domestic water heating at first met with considerable opposition. In all the instances just mentioned the increased cost of operation by using gas was equally as much (and often more) at variance with the old fuel as gas fuel for house heating is in excess of hard coal. It must be remembered that gas house heating is not expected to become, in the near future, as universal in its application as gas for other home purposes, but in a great many cities in the United States the climatic conditions are favorable to the use of gas fuel, and it is reasonable that the subject deserves the most rigid investigation and the most liberal chance for development. Certainly, the added cost of operation cannot be urged against the scheme, for experience does not bear out the argument, and, rather than disparage the development of this almost unlimited field, we should seek out the ways and means by which it can profitably be brought within the scope of the commercial progress of the gas industry. Thus far the discussion has dealt little or not at all with the strictly commercial aspects of the subject in relation to its money earning capacity for the Company. No well managed company or corporation will, or is expected to, plunge hastily into this comparatively new departure of the industry, and one cannot see any necessity for a hasty conclusion, either for or against the project without first subjecting it to a most rigid study and investigation. It cannot be claimed as yet that the entire problem has been fully solved—in fact, only a beginning has been made. During the present heating season, and for 2 or 3 in the immediate future, the Company will not become so deeply involved in house heating in St. Louis as to have any appreciable effect upon its manufacturing plant or its distribution system. But the increasing demand for gas for this particular purpose unquestionably points the way to a splendid opportunity for a wholesale outlet for its product, so that it would be a short-sighted policy not to give judicious consideration to this phase of the question. As intimated in the beginning of this discussion, this feature is being viewed in its relation to a policy which has to do with the development of a larger wholesale field, so it is a little early, perhaps, to rigidly estimate its commercial value. There is little doubt that a company considering the advisability of assuming an extensive house heating load will, at the same time, look carefully into the possibility of developing a strictly summer load to absorb as nearly as possible the excess manufacturing capacity available because of the winter peak load. Not alone will this condition obtain relative to a wholesale summer load, but the well-informed manager whose view is unimpaired by pride or prejudice must recognize in the gas business the ever varying and fluctuating conditions as imposed by rigid and relentless competition. For every inroad made by a commodity of some different type, but supplying the same human necessity, there must be a counterbalancing extension of activity by the gas company in order that, even in peak load months, the manufacturing plant can be operated at the capacity for which it is designed and constructed. For every city, no doubt, this subject becomes an individual problem, so that it is impossible for one city to formulate a policy which is applicable to every other city, though everyone at all interested can be of material assistance in discussing and attacking the proposition from every possible angle. As progressive, intelligent gas men a concerted effort on our part should bring us into the illuminated byways that lead into the fields of wholesale privileges. We should broaden our horizon. The arc lamp, the kitchen range, the water heater, and their kindred appliances are but the foothills leading up to the mountains of our opportunity. Beyond is a new skyline, its defiant peaks luring us ever onward and upward to the end that the gas industry will have its superstructure so well reared upon the rock foundation that it will be lasting and enduring for all time.

Some Figures from the Annual Report (Dec. 31, 1912) to the Shareholders of the New York Consolidated Gas Company.

From the introductory chapters of the aforesaid report it is found that the total assets of the Company amounted to $150,628,978.73, of which plant and property are returned at a value of $53,262,668.67, and bonds and stocks and advances to affiliated Companies are figured in at $92,670,159.36—the balance is variously credited to cash in hand, accounts receivable, material and supplies, etc. *Per contra*, capital stock goes at $99,816,500; debentures and notes, $8,738,100; accounts payable and accrued charges, $5,588,334.67; stock and bond premiums, $13,951,396.99; renewal and reserve, $9,920,088.30; p. and l., $12,614,558.77. The total earnings for the year on gas account amounted to $1,609,582.53, to which should be added certain earnings applicable to "tangible and intangible property," chiefly concerned in the operations of "The Astoria Light, Heat and Power Company," amounting to $1,019,605.73, or a total of $2,629,188.26. This is equivalent to 3.32 per cent. on the "tangible and intangible" property employed in the manufacture and distribution of gas sold by the Company. The dividend paid for the 12 months was 6 per cent., amounting to $5,988,990, and the funded interest absorbed $479,435.19; but the dividends and interest on stocks and bonds of other Companies controlled by the Consolidated amounted to $5,375,935.95, thus happily enabling the carrying to surplus account of $1,536,699.06, a decrease of $26,188.54 from the sum credited to like account in 1911. Renewals and contingencies on Consolidated Gas account absorbed $1,325,362.20. The net sum reserved for renewals and contingencies in 1912 by the Company and its affiliations was $4,151,227.58, or 1.18 per cent. of the all-combined assets of the Companies, now shown on their books at $353,053,244 62. Undistributed surplus earnings for all the Companies involved amounted to $4,728,759.72. A very interesting section of the report is this, given *verbatim:* "Owing to extraordinary expenditures on account of the extremely cold weather in January and February, 1912, which caused a vast amount of additional work in clearing frozen services and house pipes (there having been 122,675 cases of this character, as against 26,278 cases in 1911), and also to the extensive repavement of city streets with new and expensive pavement, which involved the overhauling of 541,722 feet of gas mains (of which 277,089 belonged to the Consolidated), or more than were overhauled during the preceding 4 years, the Company, from its operations in 1912, shows a net decrease, notwithstanding the fact that there was an increase in the sales of gas, in 1912 over 1911, of 2.88 per cent." It is also noted that an increase in prices of materials used by the Company, in 20 of the largest items, amounted to 12 per cent. For instance, these percentage increases are shown in: Cast iron fittings, 16; sheet steel, 10; copper, 30; bolts, 10; solder, 7; belting, 15. In fact, in the concrete, the cost of the materials used as named, compared with those used in 1911, the excess for the former year approximated the sum of $339,000. Again, *verbatim:* "By reason of the shortage in the supply of petroleum products, a general increase has taken place in the price of gas oil, of which from 4 to 5 gallons are used for each 1,000 cubic feet of water gas manufactured, in order that the gas delivered to the public may have the illuminating power prescribed by law. When it is considered that an increase of 1 cent per gallon in the price of gas oil affects the cost of gas nearly 5 cents per 1,000 cubic feet and that the increase in the price, already made to some companies, has varied from 1 cent to 2½ cents per gallon, the serious effect of such increase upon the revenues of gas companies will be realized. Fortunately the Company's 3-year contract for gas oil will not expire until the end of the current year, and, therefore, the Company will not begin to feel the effect of the increase in its price until 1913. The modified electric rate schedules, which, as stated, in our last report, were put into operation July 1st, 1911, by the New York Edison and the United Electric Light and Power Companies, resulted in a reduction in the gross electric revenue during the year ending July 1st, 1912, of $1,258,774. * * * The application of the Consolidated Gas Company to the Public Service Commission of the First District, for permission to purchase the preferred and common stocks of the New York and Queens Electric Light and Power Company and the stock of the New York and Queens Gas Company, referred to in our last report, is still pending before that Commission. The preliminary abstract of the report of the Commissioners, appointed to appraise the value of the property of the Consolidated Gas Company, in the blocks bounded by 16th and 18th streets, between 10th avenue and North River (including the water front), condemned by the city in 1902, and to appraise the damages to the remaining property in these blocks, belonging to the Company, was filed on June 1st, 1912. The hearing, which was to have been held on June 26th, 1912, upon the objections filed by the various parties to this preliminary report, was indefinitely adjourned, owing to the death of the Chairman of the Commission. The new Commissioner is now engaged in considering the testimony and briefs. The tunnel between Astoria and the Bronx has been extended 2,464 feet during the past year. More rapid progress was prevented by reason of soft and treacherous rock, encountered at a distance of about 800 feet from the Bronx shaft. After working into it for some months with slow progress, it was thought best to suspend work on that heading and push forward the Astoria heading to meet it. When this heading had reached a point about 200 feet distant from the Bronx heading, the same treacherous, water bearing rock was encountered on the west side of the drift. As our previous experience with this faulty seam gave reason for the belief that it crossed the line of the tunnel in a diagonal direction, a small drift or tunnel was started on the east side of the main tunnel, where the rock was still solid, in order to determine the point where the seam would be found on the east side and to discover if it extended entirely across the line of the tunnel excavation. This small drift was carried forward about 100 feet to a point about 95 feet distant from the Bronx heading, where faulty rock was again encountered. Further excavation in the small drift was then suspended and again commenced on the main tunnel, until it reached a point about 175 feet from the Bronx end, toward the close of December, 1912. Since that time progress has been very slow. Comparatively few accidents have occurred during the tunnel construction, notwithstanding the hazardous nature of the work, the quantity of high explosives employed and the constant danger from the dislocation and falling of masses of rock from the top of the excavation before the concrete arch, which should form the roof of the tunnel, could be completed. The 72-inch pipes, to be laid in the tunnel when completed, are now being delivered, and the concrete saddles on which they will rest are in process of manufacture. The system of transit mains, connecting the various boroughs, was further advanced during the year by the laying of 6 miles of 48 inch main from the Bronx end of the Astoria tunnel to the Central Union works, foot of East 138th street, and from the Central Union to the new holder at Fordham road and Harlem River Terrace. With the completion of the new tunnel and the installation therein of transit mains, connecting the distributing systems in the Bronx and Astoria, there will have been completed comprehensive plans for insuring an uninterrupted supply of gas in the 3 boroughs supplied by the Consolidated Gas Company and its affiliated Companies, thus conserving permanently the safety and convenience of the public.

"The new water gas plant at Astoria was put in operation May 3d, 1912. Each generator in this station has its individual turbine-driven blower, directly connected to it, which is an arrangement more satisfactory than the former practice of having an independent blower plant in a separate building, from which the air supply was common to all the generators. It minimizes the danger of explosion in the air-conducting pipes and enables the operator to vary at will the air pressure and supply to each generator. Exhaust steam from the turbines and pumps, which, according to former processes, was unavailable for the purpose, is now used for gas making in the new plant, instead of live steam, direct from the boilers. Both of the foregoing improvements are proving more economical than the former practice, and are the result of our experiments of last year in some of our other plants, before the completion of the Astoria plant. In our coal gas settings the Company has finally adopted silica material as being more economical. Its first cost, which is greater than that of fireclay, is more than compensated for its longer life and the better results obtained from its use.

"The market for residuals has shown an improvement during the past year. Better prices were obtained for coke, owing to the higher prevailing prices for anthracite coal, and to the fact that a large quantity was used in the generators in the new Astoria water gas plant, thus enabling the Company to maintain a higher price for the coke which was sold. The prices obtained for sulphate of ammonia also showed an improvement. The market for coal tar remained about the same as during the preceding year. The many inquiries, which are received regarding our water gas tar, are encouraging the belief that there will be a better market in the future for this residual product than in the past.

"Some interest has been shown of late among chemical manufacturers in spent iron oxide, which has been used for the purification of gas, and some of it has been disposed of for use in the recovery of the sulphur and cyanide contained therein. For many years past

the Company has been unable to dispose of it and has been obliged to use it in connection with ashes and other debris for filling in land. Cyanogen press cake has been in better demand through the year, because of the better market prices for yellow prussiate of potash and prussiate of soda derived from it, and our present contract for its sale is better for the Company than the previous one, thus increasing our revenue from this residual. This demand may be expected to continue, unless some alteration of the present tariff on the products derived from cyanogen permits their importation into the country at reduced rates.

"The new gasholder, at Fordham Road and Harlem River Terrace, Kingsbridge, having a capacity of 10,000,000 cubic feet, was put in commission July 30th, 1912, and is now supplying gas and regulating the pressure in the upper northwesterly section of the Borough of Manhattan and in a portion of the territory of the Central Union and the Northern Union Gas Companies in the Borough of the Bronx.

"Our Emergency Department at the present time is equipped with 5 automobiles, stationed as follows: At Hester and Elizabeth streets; two at 66th street and West End avenue; at 111th street and 1st avenue, and at 474 West 159th street. These emergency wagons are equipped with all the necessary tools for any emergency that may occur, owing to any leak of gas. The promptness in leaving stations, in response to calls, and the short time elapsing in almost every instance in arriving at the source of the complaint cannot be excelled by even the fire department, and the system is unquestionably the most efficient of any gas company in the world to-day. The following are a few specimen calls, showing the time elapsed from the receipt of the call, leaving the station and arriving at the leak:

66th Street St. Dept	Time Rec'd.	Time Leaving Yard	Time Arrival at Leak.	Time Elapsed.	Remarks.
43d St. and 1st Av.....	6:47 P.M.	6:47:10	6:55 P.M.	7 min. 50 sec.	Secured broken 6 in. main.
111th Street, St. Dept					
182–4 W. 82 St.	4:15 P.M.	4:15:15	4:27 P.M.	11 min. 45 sec.	Secured broken 4 in. main.
2445 8th Ave..	6:02 P.M.	6:02:15	6:07 P.M.	4 min, 45 sec.	Secured broken 2 in. service.
161 W. 84th St.	2:50 P.M.	2:50:15	2:59 P.M.	8 min. 45 sec.	Secured broken 1¼ in. service.

This Company purchased, and placed at the service of physicians, hospitals, Fire and Police Departments and the public in general, 4 pulmotors. These are designed for the resuscitation of victims of asphyxiation from whatsoever cause, and have proved highly efficient in so doing. Approximately 150 employees of the street department of the Company have been instructed by competent physicians in the application of the pulmotor; and these same employees, and hundreds of others, have also been taught the new methods of artificial respiration. All hospitals, and the Police and Fire Departments, have been notified of the installation of these appliances and that the Gas Company's emergency department will respond immediately to all calls for the same. Although these pulmotors were only installed during the past autumn, they have been instrumental in saving a number of lives. The following are typical cases:

Location.	Call Received.	Time Leaving Yard.	Time of Arrival.	Time Elapsed.	Remarks.
W. 47th..	3:45 P.M.	3:45:10	3:48	3 min.	Police Dpt. requested Pulmotor—Successful.
W. 52d...	11:35 A.M	11:35.10	11:42	7 "	do
W. 42d...	7:58 A.M.	7:58:10	8:02	4 "	do
W. 46th..	9:58 A.M.	9:59	10:04	6 "	do
E. 62d....	7:30 A.M.	7:30:10	7:35	5 "	do

(To be Continued.)

Recent Patent Issues.

Prepared for the American Gas Light Journal by Royal E. Burnham, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 20 cents.

1,051,592. Gas Lamp. F. J. & H. R. Humphrey, Kalamazoo, Mich., assignors to General Gas Light Co., same place.

1,051,593. Gas Lamp. F. J. & H. R. Humphrey, Kalamazoo, Mich.

1,051,677. Manufacturing Incandescent Bodies. W. Bruno, Berlin, Germany.

1,051,776. Attachment for Gas Stoves. M. F. Stiles, Valparaiso, Ind.

Items of Interest
FROM VARIOUS LOCALITIES.

A BILL has been introduced in the Maine Legislature (by Rep. Kelleher, Waterville) to incorporate the Kennebec Gas and Fuel Company. Messrs. H. W. Abbott, L. E. Thayer and M. J. Bartlett (Waterville), Silas T. Lawrie (Fairfield), Jno. H. Lancaster (Skowhegan) and W. J. Kuemmerle, Jr. (Philadelphia, Pa.), are the incorporators, and the avowed purposes of the Company are to manufacture and distribute gas for heating, lighting and mechanical purposes in the city of Waterville, and the towns of Oakland, Vassalboro, Winslow, Benton, Fairfield and Skowhegan. The initial capitalization is placed at $500,000.

THE Havana (Cuba) Electric Railway, Light and Power Company has awarded a contract to the United Gas Improvement Company, which provides for the placing of a complete water gas plant installation, to consist of 2 sets of Twin Generator, standard double-superheater, Lowe water gas apparatus. Each set is to have a guaranteed capacity of 3,500,000 cubic feet per day. The blowing plant is to consist of two 200-horse power, direct-connected, turbine blower units. The apparatus will, as usual, be equipped with all the latest improvements that the U. G. I. Company has perfected, including its patented devices for measuring air and steam to the generators, dust catchers, pyrometers, etc. The utilization of the waste heat from the blast gases, as well as that from the illuminating gas, will be provided for by the installation of the U. G. I. Company's type of double waste heat boilers. By utilizing the sensible heat of the gases sufficient steam will be provided to operate the plant. The great growth of the Cuban Metropolis has made necessary these named large extensions to the plant equipment of the Gas Company.

THE American Gas Construction Company, of Newton, Ia., has applied to the authorities of Mandan, N. D., for a 30-year franchise under which to operate a gas plant.

MR. DE VER H. WARNER, formerly Vice-President of the Bridgeport (Conn.) Gas Light Company, has been chosen to succeed his late father as President of the corporation. We noted last week that Mr. Frank M. Travis had been elected to the Vice-Presidency.

MAYOR FITZGERALD, of Boston, has signed the contract approving another 6 months extension of the public lighting contract between the city and the Rising Sun Company. The contract dates from the 1st inst., and the rate per lamp per annum is $23.60.

THE management of the gas plants at Gardner, Mass., and Athol, Mass., will hereafter be under the control and management of Mr. Abbott A. Laughton. The headquarters will be in Gardner, but twice each week Mr. Laughton will hold forth in Athol. On the 1st inst. some of his Gardner friends presented him with a loving cup as a testimonial of their regard.

ADVICES from Ogden, Utah, under date of January 25th, inform us that the Pintsch Gas Company's first prize ($100) awarded annually for the station showing the best yearly record for service, modified by standing or current actual condition of plant, went this year to Superintendent George Lochhead's men and station at Ogden. Mr. Lochhead has supervisional charge of the Pintsch stations in Pocatello, Los Angeles, Billings and Ogden; also, the transfer station at Salt Lake.

MR. J. M. FRIED, formerly in the service of the Milford (Mass.) Gas and Electric Light Companies, has been appointed Commercial Agent for the Northumberland County (Pa.) Gas and Electric Company, with headquarters in Sunbury, Pa.

THE Public Service Commission of Maryland has, without qualification, assented to the petition of the Baltimore Consolidated Gas and Electric Company that it be allowed to exchange its preferred shares to common stock.

MR. STEPHEN S. PALMER, a member of the Board of Directors of the National City Bank, of New York, and more or less closely associated with the financial affairs of the Consolidated Gas Company, of New York, died in Redlands, Cal., the 30th ult. He was born in New York city, May 15th, 1853, his ancestors ranking amongst the oldest settlers of Manhattan Island; and many of them were prominent in National, State and city affairs. About 10 years ago Mr. Palmer re-

moved to Princeton, N.J.—he was a graduate of that University—and amongst his benefactions thereto is the complete laboratory that was added to the Universities possessions in 1910. Subsequently he journeyed to the Coast settling in Redlands about 5 years ago. Prominent in the many enterprises with which he was connected is the Empire Zinc Company, of Palmerton, Pa., in which community he caused to be erected a beautiful Chapel as a memorial to his wife, who died in 1903. His connection with banking, railroad, and commercial interests—notably in the Lackawanna Steel Company—were many, as also were his affiliations in and with Club life in New York city. He was gifted with a most attractive personality, and it may be truthfully said of him that his charities, usually done under the seal of quietude, were numberless.

THE Wall Street *Journal*, of the 1st inst., says that all shareholders desiring to exchange the called $6,360,054 preferred stock of the Baltimore Consolidated Gas, Electric Light and Power Company for new common stock, share for share, must deposit their preferred stock not later than the close of business, March 1, with the Continental Trust Company, of Baltimore, or with Messrs. Kitcat and Atkin, of London, England. All stock deposited for exchange will receive the full paid common on April 1, with the dividend then due on the preferred. The new common stock will not be entitled to the quarterly dividend which will be carried by the old common on that date. It is understood that, immediately after the 1st of March the Company will call for payment, at 120 and accrued dividends, all preferred stock which has not been deposited. It may legally do this, on giving 30 days' notice, for the Maryland Public Service Commission, in approving the new common, specifically provided for the calling of all preferred not exchanged.

"MR. FRANK L. KOUHOUPT, since 1903 connected with the Danbury and Bethel (Conn.) Gas and Electric Company, is now Travelling Gas Expert for the H. L. Doherty syndicate, which corporation secured control of the named Connecticut properties some time ago. His headquarters will be in New York. I am pleased to assert that, during his long term of service with the Danbury Company, Mr. Kouhoupt has shown marked ability and has displayed qualities that won for him the confidence of his superiors. His good business traits made his work here stand out far beyond the average, and his courtesy and ever willingness to be of service have made him a favorite amongst the patrons of the Company. While in Danbury he made a host of friends, and his departure from the city will be cause for sincere regret; but, that regret will be well softened in the knowledge that he leaves here to go into quarters that will afford him much greater opportunities to show his ultimate worth than could be given him here.—C."

MR. HORACE BROWN, hitherto Manager of the Lewes (Del.) Maritime Exchange, is now General Manager of the Lewes Gas Company. He assumed charge the 1st inst.

THESE Directors were chosen at the annual meeting of the Ashtabula (O.) Gas Company, Messrs. George W. Wright, E. S. Templeton, E. P. Hall, J. F. Munsell, Thos. Fricker, J. L. Smith and F. W. Stone. The Directors elected these executives: President, George W. Wright; Vice-President and Secretary, E. S. Templeton; Treasurer and Manager, F. W. Stone; Asst. Supt., J. H. Willsey.

SENATOR GARST, of Worcester, Mass., is certainly a breezy sort of chap, if one may judge him by his attempted works. Not satisfied with introducing a bill to cause the new Telephone and Telegraph Company to cut its rates in "worse than two," he has a follow up in the shape of a bill which provides that any Company which charges for the use of a meter, during any portion of 12 consecutive months that a consumer uses gas to the value of $7, shall be punished by a fine not exceeding $100 for each offense.

THE Fall River (Mass.) Gas Works Company, so says the Fall River *Herald* of recent date, is making plans for a huge coal gas works plant at Birch and Bay streets. The new plant is to have a capacity of about 10,000,000 cubic feet per day, and it will be of the coal gas type. The high price of enriching oil is said to be responsible for this determination of Superintendent Nute and his Directors.

THE New York Public Service Commission has authorized the proprietors of the South Shore Gas Company, operating in the Long Island settlements of Babylon, Amityville, Farmingdale and Oyster Bay, to issue 5 per cent. bonds to the par value amount of $50,000, and capital stock in the sum of $25,000. It is specified that the bonds are to be sold at not less than 87, the proceeds of both issues to be used for needed extensions and additions to the distributing and generating plants.

ON the 3d inst., the Committee on Labor, Massachusetts Legislature, gave a hearing in respect of the usefulness of the measure known as the "Conant Bill," the purpose of which is to have it declared unlawful to import or employ persons, from one town or city to another, to break strikes on labor account of any sort. A labor agitator named Daly, in upholding the measure, declared that during the last car strike in Boston the city was infested with a horde of undesirables, known as professional "strike breakers," citing several examples in which passengers were maltreated by the said "breakers." He did not, of course, make any reference to the many instances in which the breakers' features, and other divisions of their bodies, were subjected to rough treatment by the "real strikers." Mr. Wm. A. Wood, Chief Engineer, the Boston Consolidated Gas Company, made a telling speech in opposition to the Conant measure. He urged that if a strike occurred amongst his Company's men, and that the affair could not be quickly settled, the Company's inability to secure breakers would imperil the people at home and in the streets through lack of proper illumination. Mr. Wood's appeal and presentation were ably seconded by arguments advanced by Mr. Wm. E. McKay, General Manager of the New England Coal and Coke Company, and by Messrs. Lord and Betherly, of the Boston Coal Exchange.

THE Fitchburg (Mass.) Gas and Electric Light Company has awarded to the Berlin (Conn.) Construction Company the contract for the structures to house the formers' new installation of the coal gas type The framework is to be of corrugated iron set over steel, and the roof is to be of steel.

THE Board of Gas and Electric Light Commissioners and the Board of Highway Commissioners as well, on the 3d inst., appeared before the Massachusetts legislative committee on Mercantile Affairs in connection with the bill now before the Committee which declares that the authority of the Highway body, in supervising telephone and telegraph companies, be transferred to the Board of Gas and Electric Light Commissioners. Chairman W. D. Sohier, of the Highway Commissioners, declared that that body had no objection to the measure, and added that an investigation now underway by the direction of the Commission, was likely to have an important bearing on the question of rates. Wherefore he thought it would be in line with good policy to permit the Commission to complete the study, which could readily be accomplished by next fall. Chairman Barker, of the Board of Gas and Electric Light Commissioners, declared that his Commission had no opinion to express relative to the bill in hand, unless that its passage would seem in line with sensible consolidation of kindred services.

ON the 1st inst. the United States Public Service Company, St. Louis, Mo., a Delaware corporation, capitalized in $10,000,000, will take over the electric light plants at Paris and Danville, Ky., and Ravenna, O.; also the gas plants at Paris, Ky., and Oberlin, O.

PRESIDENT LAMSON and his capable aide, Mr. Dana D. Barnum, have completed a comprehensive mapping of the adjacent settlements to which a gas supply will be piped this spring. The main districts to be hooked are respectively known as Greendale and Lake View and Barber's Crossing. The pipe required will weigh at least 1,000 tons, and none of the stretches will carry pipe less than 4 inches diameter. Of the leading lines 2 miles of 16-inch have been arranged for, and there will be at least an equal length of 12-inch.

ACCORDING to the annual report of the Directors of the Georgetown (D. C.) Gas Light Company, which was sent to Congress the morning of the 1st inst., the sendout for the year amounted to 146,025,636 cubic feet. The total receipts aggregated $147,798, which sum includes: By-products (coke, tar and the like), $21,957, and $1,372 from "other sources." Net profits for the year were $37,971, out of which $11,533 went to paying taxes; and interest absorbed $26,400. Dividends (charged against the gross) account for $15,000. The surplus on hand from operating expenses was $38.37. Depreciation was credited with $4,996, The report notes further that there are registered in the name of the Washington Gas Light Company 3,500 shares of its stock, but that the Georgetown Company, denying the validity of this shareholding, had instituted a suit in the Supreme Court of the District to settle the moot points. Mr. Thomas F. Holden has been appointed Chief Engineer to the Company. Its accounts payable are just short of $10,000.

The Market for Gas Securities.

While the tendency of the market was decidedly on the order vacillating the past week, nevertheless there was prevalent an obstinate resistance to permitting Consolidated to go below 135. The quotations came in this morning (Friday) at 137 to 137½, but as to actual transactions there was very little doing. City gas bonds are in fair demand, and 100 was bid for a small lot of Bronx Gas and Electric.

As to out of-town shares the quotations were rather limp, Peoples, of Chicago, selling at 115; Brooklyn Union was 136 to 140; Lablede common stalled around last week's figures; as also did Massachusetts gas.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

FEBRUARY 10.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	Capital.	Par.	Bid.	Asked
Consolidated Gas Co.	$90,816,500	100	137	137¼
Central Union Gas Co.—				
4 1st 5's, due 1927, J. & J.	3 5 0,000	1,000	103	105
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	105	106
Mutual Gas Co.	2,500,000	100	73	177
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	101	102½
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	59	62
1st Mtg. Gold Bds. 5 p. ct.	1,500,000	—	98½	100½
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	96	100
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	99½	101
Standard	5,000,000	100	60	70
Preferred	5,000,000	100	90	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	103	105
The Brooklyn Union	15,000,000	1,000	136	140
1st Con. 5's, due 1948, M. & N.	15,000,000	—	105½	107
Yonkers	999,650	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	½	⅝
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	500,000	1,000	97	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	6
Bonds, 5's	5,250,000	1,000	59	60
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed				
Gold Bonds	7,860,000	1,000	104	106¼
Cincinnati Gas and Electric				
Co.	39,500,000	100	87	90
Columbus (O.) Gas Co., 1st				
Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. &				
Heating Co.	1,682,750	100	90¼	91
Preferred	2,026,500	100	75¼	80
Consumers, Toronto	2,000,000	50	300	304
Consolidated, Baltimore	13,460,084		118¾	119
Mortgages, 5's	3,400,000	—		—
General Mortgage 4½	10,661,000	—		—
Con. Gas Co., Baltimore				
City, 4½	2,751,000	—		—
Consolidated Gas Co. of N. J.	1,000,000	100	15	—
Con. Mtg. 5's	976,000	1,000	94	96
Bonds	75,000	—	—	100
Detroit City Gas Co.	6,580,000	—	—	50
Detroit Gas Co., 5's	881,000	1,000	75	80
" Prior Lien 5's	5,619,000	1,000	97	100¼
Equitable Gas & Fuel Co.,				
Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	133	136
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co.,				
1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of				
New Jersey	10,500,000	—	130	133
" Bonds, 5's	10,500,000	—	104	106
Indianapolis	2,000,000	—	38	45
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	89	—
" 1st Mtg. 5's	200,000	1,000	91	
Kansas City Gas Light Co.,				
of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,852,000	1,000	98½	99
Laclede Gas Co., St. Louis.	10,000,000	100	103½	104½
Preferred	2,500,006	100	99	102
Bonds	10,000,000	1,000	102½	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	120	120
Madison Gas and Electric Co.				
" 1st Mtg. 6's	400,000	1,000	106	
Massachusetts Gas Companies, of Boston	25,000,000	100	91¼	92
Preferred	25,000,000	100	93¼	93½
Montreal L. H.& P., Canada	2,000,000	100	235½	236
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	97	98
Bonds, 6's	6,000,000	—	127	128
New Haven Gas Co.	5,000,000	25	192	195
Peoples Gas Lt. & Coke Co.,				
Chicago	25,000,000	100	115	115½
1st Mortgage	20,100,000	1,000	102	102½
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104½	105½
Pacific Gas and Electric Co.	15,500,000	—	61	62
St. Joseph Gas Co.—				
1st Mtg. 5's	1,000,000	1,000	96	98
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	105
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	3,447,000	1,000	94	96
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	101	103
Washington (D. C.) Gas Co.	1,800,000	200	427½	430
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	—	—

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, Richmond, Va., October 15-17, 1913. Officers: President, W. R. Addicks, New York City. Secretary, Geo. G. Ramsdell, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting Sept. 1913. Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, New York City, Oct. 8, 1913. Officers: President, C. G. M. Thomas, Long Island City, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street, New York City.

Gas Meters.—Monthly Meetings; New York Section, Chairman, Will W. Barnes; Secretary, H. Thurston Owens, 42 Pine street. Philadelphia Section; Chairman, L. R. Dutton; Secretary, H. F. Patterson, Jr., 633 Chestnut street. Cleveland Section, Chairman, F. R. Hutchinson; Secretary, Wm. Holtz. East Ohio Gas Co. New England Section, Chairman, F. M. Roberts, Haverhill; Sec., F. K. Wells, 60 Broad st., Boston.

Guild of Gas Managers of New England.—Annual meeting, March, 1913. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, March 19th and 20th, 1913. Chicago, Ills. Officers: President, H. O. Channon, Quincy, Ills.; Secretary-Treasurer, Horace H. Clark, 115 No. Oak Park avenue, Oak Park, Ills.

Illuminating Engineering Society.—Annual meeting, ——— September, 1913. Meetings of Sections, monthly. Pres., Preston S. Millar; General Secretary, J. D. Israel, 29 W. 39th street, New York City. Sections: New York, Secretary, C. L. Law, 124 West 42d street. New England, Secretary, H. C. Jones, 10 High street, Boston, Mass. Philadelphia, Secretary, L. B. Eichengreen, Broad and Arch streets. Chicago, Secretary, J. B. Jackson, 26 North Market street. Pittsburgh, Secretary, J. C. Mundo, Oliver Building.

Indiana Gas Association.—Annual meeting, March 12 and 13, 1913. Indianapolis. Officers: President, Howard L. Olds, Indianapolis; Vice-President, Wm. Wallace, Lafayette; Secretary-Treasurer, Philmer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, May 22, 23, 24, 1913; Burlington, Ia. Officers: President, C. W. Fair, Atlantic, Ia.: Secretary, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, October——1913. ——— Officers: President, L. O. Ripley, Emporia, Kas.; Secretary and Treasurer, W. H. Fellows, Leavenworth, Kas.

Michigan Gas Association—Annual meeting, September——1913; ——— Officers: President, W. S. Blauvelt, Detroit, Mich; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April, 1913; Mexico, Mo. Officers: President, P. A. Bertrand, Joplin, Mo.; Secretary and Treasurer, P. W. Markham, Brookfield, Mo.

National Commercial Gas Association.—Annual meeting and gas show, Dec. 1-6, 1913. Philadelphia, Pa. Officers: President, C. W. Hare, Philadelphia Pa.; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, Cleveland, O., May 20 22, 1913; Officers: President, M. B. Daly, Cleveland, O; Secretary, T. C. Jones, Delaware, O.

New England Gas Association.—Annual meeting, February, 19th and 20th, 1913 Boston. Officers: President, D. D Barnum, Worcester, Mass.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

New Jersey State Gas Association.—Annual Meeting April —, 1913, ——— N. J.—President, William H. Pettes, Newark, N. J.; Secretary-Treasurer, Arthur H. Osborn Belmar, N. J.

Ohio Gas Association.—Annual meeting, February ———, 1913, Columbus, O.; President, John M. Garard, Columbus, O.; Secretary, L. B. Denning, Columbus, O.

Oklahoma Gas, Electric and Railway Association.—Annual meeting, Oklahoma City May, ——1913. President, F. W. Caldwell, Shawnee, Okla.; Secretary, H. V. Bozell, Norman, Okla.

Pacific Coast Gas Association.—Annual meeting, San Jose, Cal., September 16, 17, 18, 1913. Officers: President, Henry E. Adams, Stockton, Cal.; Secretary-Treasurer, Henry B stwick, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, York, Pa., April 9-11, 1913; Officers, President, H. H. Ganser, Norristown, Pa.; Secretary-Treasurer, W. O. Lamson, Jr., West Chester, Pa.

Society of Gas Lighting.—Annual meeting Dec., 11, 1913; monthly meetings, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 29 West 39th street, New York city

Southern Gas Association.—Annual meeting, Charlotte, N. C., April 18-20, 1913, Officers: President, C. E. White, Montgomery, Ala.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. May 21, 22, 23 and 24, 1913, Galveston, Tex. Officers: President, F. M. Lege, Jr., Galveston, Tex.; Secretary H. S. Cooper, 405 Slaughter Bldg., Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May 14 and 15, 1913, Milwaukee, Wis. Officers: President, I. F. Wortendyke, Janesville, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.